CLAIMS

1. A method of applying a plurality of caps to a plurality of microfabricated devices at the wafer stage, the method including:

a) forming a plurality of hollow molded caps, as an array, from a layer of thermoplastic material which is placed in a mold, the mold having first and second mold halves which are brought together to form the caps, each cap having a central portion and a perimeter wall;

b) retaining the array in one of the mold halves;

c) applying the caps simultaneously to one side of a wafer with each cap overlying part or all of a device with a free edge of the perimeter wall contacting the wafer; wherein

d) the coefficient of thermal expansion of the mold half retaining the array is compatible with the coefficient of thermal expansion of the wafer.

2. The method of claim 1 further comprising the step of:

applying a plurality of second caps to a second side of the wafer, before separating the wafer into individual packages.

3. The method of claim 1 wherein, the wafer is separated into individual packages by a deep plasma etch of the wafer.

4. The method of claim 1 wherein, caps are applied to the top and bottom of the wafer and material between caps is removed by a deep plasma etch from the bottom of the wafer using the caps that are applied to the bottom of the wafer as masks.

5. The method of claim 1 wherein, the mold is made from a semiconductor.

6. The method of claim 1 wherein, applying the separated caps further comprises using a release wafer having pins which pass through holes in a mold half.

7. The method of claim 6 wherein, the first mold half has openings for receiving the pins, the pins being longer than the openings.

8. The method of claim 6 wherein, there is a gap between the first mold half and the release wafer, and using the release wafer further comprises applying a vacuum to the gap.

9. The method of claim 1 wherein, the caps are formed from a layer of thermoplastic material, and further comprising the step of etching caps under an oxygen plasma etch process.

10. The method of claim 9 wherein, forming the caps comprises heating the layer with infrared radiation while it is in the mold.

11. The method of claim 1 wherein, the first and second mold halves each have eject holes for receiving eject pins which are formed on adjacent release wafers.

12. The method of claim 1 wherein, the thermoplastic material is 200-500 microns thick prior to being formed into caps.

13. The method of claim 1 wherein, a thin layer joining adjacent caps during molding is removed a squeezing action of the mold.

14. The method of claim 1 wherein, a thin layer joining the caps after molding is of the material from which the caps are formed, and the thin layer is removed by an oxygen plasma etch.

15. The method of claim 13 wherein, the thin layer is removed by a squeezing together of portions of the mold halves which have unetched top surfaces.

16. The method of claim 1 wherein, the wafer further comprises chips that are substantially completely packaged prior to being separated.

17. The method of claim 1 wherein the thermoplastic material absorbs infrared radiation within the wavelength range of about 1000 nm to about 5000 nm.

18. The method of claim 1, wherein, the first mold half has a lower surface into which is formed a series of recesses defined by lateral edges, the second mold half having an upper surface in which is formed a series of grooves, the grooves aligning with the edges to define mold cavities, the recesses and grooves having a repeat spacing that corresponds to a spacing on a wafer to which the caps will be applied.

19. The method of claim 18, wherein the grooves or the recesses are separated by a portion of a substrate which has not been etched.

20. The method of claim 1 wherein, the caps are formed of a material is substantially unaffected by an etch to remove wafer material.